DOCUMENT RESUME

ED 277 289 HE 019 825

AUTHOR Leveille, David E.
TITLE The California and Central Valley Microwave Network: Serving Adult Learners through Lifelong Learning Opportunity.
PUB DATE Oct 86
NOTE 11p.; Paper presented at the National Conference of the American Association for Adult and Continuing Education (Hollywood, FL, October 1986).
PUB TYPE Viewpoints (120) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Adult Students; *College Programs; *Continuing Education; *Educational Television; Higher Education; Lifelong Learning; Nontraditional Education; Nontraditional Students; *Program Development; Program Implementation; *Telecommunications
IDENTIFIERS *Central Valley Microwave Network CA

ABSTRACT

Ways that technology is being integrated into the instructional and administrative operation of U.S. colleges are considered, along with the application of one of the technologies, microwave, to adult learning opportunities. Changing demographics relating to adult learners over the next 10 to 15 years are identified. Eight projects applying technology to adult learners are briefly described, including the Central Valley Microwave Network in California. Among the many communication technologies being used, Instructional Television Fixed Services (ITFS) or other forms of terrestrial microwave are advancing educational opportunity for the adult learner. While some systems stand alone, most are part of a telecommunication technology system involving more than one technology (e.g., ITFS, satellite, microwave, telephone and computer technologies). Considerations on applying technology to adult learners concern: support from the central administration; policy endorsed by the governing board; involvement of many individuals; the development of a technical infrastructure; use of a time frame incorporating the worst case scenarios; visible advocates and good human resources; and a sound business plan for using microwave technology for adult learners. (SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED277289

The California and Central Valley Microwave Network:

Serving Adult Learners Through Lifelong Learning Opportunity

David E. Leveille, Ed.D.
Deputy State University Dean, Special Projects
The California State University
Long Beach, California 90801

A paper presented at the national conference of the
American Association for Adult and Continuing Education
Hollywood, Florida
October, 1986

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

David E. Leveille

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

HE 019 825

THE CALIFORNIA AND CENTRAL VALLEY MICROWAVE NETWORK: SERVING ADULT LEARNERS THROUGH LIFELONG LEARNING OPPORTUNITY

DR. DAVID E. LEVEILLE
CHANCELLOR'S OFFICE
THE CALIFORNIA STATE UNIVERSITY

OVERVIEW

How many times, over the past fifty years, have members of the academic community and the public-at-large read or heard breathless prose forecasting the impending educational millenium because of a particular technological innovation? Fifty years ago, radio broadcasting was supposed to revolutionize education. Soon thereafter, teaching machine afficionados predicted sweeping changes would be brought about by their particular device. Then, television was touted as the medium which would bring about extraordinary changes in the educational process. Likewise, computers, lasers, video-cassette and video-disc machines, and communications satellites have been pushed by one individual or another as innovations which would have a major impact on the educational process.

Although in the past the creative uses of communication technologies were spotty at best, due to their being viewed as expensive frills and add-ons to the regular educational processes, more recent experience suggests that the application and utilization of communication technologies within the educational environment is alive and well, and growing. This is particularly true when one considers the extensive efforts underway to provide a relevant, high-quality educational opportunity to everyone, regardless of geographic location. Indeed, access to higher education to overcome the evil of ignorance, the curse of professional obsolescence, and increase equality of opportunity has never been greater.

Hardly a day goes by without the daily press or other journalistic outreach carrying information about the changing nature of our society and the challenges posed for the 21st century. The attention to these issues in the popular media reflects the explorations of government and industrial leaders to assess where we are and where we are going.

Strong demands for greater flexibility in the educational system and the need for more innovative learning opportunities for current members of the work force and other mature citizens, as well as recognition of the need to expand and strengthen education at all levels, has placed the issue on the national agenda.

Recently, state higher education executive officers, state government officials, and others held a conference relating to the subject. Because of the significant growth in the use of new technologies for the delivery of instruction, research, and the extension of public services, major planning efforts are underway across the country to deal with such issues as quality assurance, coordination, financing, and system integration. Some states also are asking questions about whether or not new technologies can be effectively utilized as solutions to some old and persistent problems

facing the states--for example, the delivery of educational programs to populations which may not have access to on-campus programs, particularly adult learners.

In attempting to provide an overview of how microwave technology is being integrated into the instructional and administrative operation of institutions of higher learning throughout the nation, an effort will be made to identify some of the changing demographics relating to adult learners over the next 10 to 15 years; a brief description will be offered on one of the technologies, microwave, being applied to adult learning opportunities; selected projects applying technology to adult learners will be identified; and finally, some brief observations will be offered reflecting experiences of those engaged in technological applications for adult learners.

UTILIZATION

The development and growth of microwave technology and its applications in adult education, indeed all of the communications technologies, is an involved and interesting one that has been affected by a series of changes in educational policy and philosophy and the creative initiatives of several key individuals across the country. It is a history that is still in the making.

A recent study undertaken for the Corporation for Public Broadcasting and the National Center for Education Statistics, Status of Instructional Technology in Higher Education, revealed that during 1984-85, the three major types of technology--computers, video, audio--were available in some form for instructional use by faculty and students in more than 90 percent of the 2,830 colleges and universities surveyed. About one-third of all institutions used video for one-way presentation of instruction to off-campus students, while 32 percent were found to have offered one or more "telecourses" during 1984-85.

Video telecourses were offered by half of all public two-year schools and 44 percent of public four-year schools.

Through microwave technology, indeed all of the communications technologies, higher education is able to provide a relevant, high quality educational opportunity to everyone, everywhere, every day.

DEMOGRAPHICS

A recent article appearing in The Chronicle of Higher Education indicated that between now and the year 2000, shifts in work and the workforce are certain to transform much of higher education as we know it.

- The proportion of the labor force from 16 to 24 years old will shrink from 30 percent in 1985 to 16 percent in 2000. Higher education, business, and the military will all be competing for this segment of the population for their students, employees, and recruits.

- An estimated 29 percent of the net growth in the work force during the next 15 years will be in minority groups. Yet high school dropout rates, which run nearly 30 percent nationally, are 40 to 50 percent in some inner city areas with large minority populations.

- Women will account for about 63 percent of the new entrants into the labor force between 1985 and 2000 and will increase their demand for child care.

- Between 2 and 3 percent of the nation's labor force--which is projected to reach about 135 million by the year 2000--may need to be retrained each year.

- Although there will continue to be substantial shifts in the mix and types of jobs in coming years, the development of businesses making high-technology products--which many states are emphasizing in their economic development plans--will not necessarily be a panacea. Several studies have found that such high technology industries account for only 4 to 5 percent of the new positions created each year, although more jobs are opening up in businesses that use computers and other high-technology equipment.

- In the next decade, about six million more jobs are projected in the most skilled occupations--executive, professional, and technical--compared to only about a million new jobs in the less-skilled and laborer categories.

- Between 1979 and 1984, an estimated 11.5 million people lost their jobs through plant closings, relocations, or technical innovations. An estimated 20 percent of those people need to improve their basic skills in reading, writing, mathematics, and communication if they are to find jobs with good chances for advancement.

- About 13 percent of United States adults are illiterate in English. That means between 17 million and 21 million Americans will have difficulty reading a job notice, filling out an employment application, or understanding an instruction manual.

The changes occurring in the workplace, as well as in society at large, have substantial impact on education at all levels. The question becomes, to what extent postsecondary education is prepared to participate in the continuing education and retraining that will be needed?

The National Alliance of Business has indicated that during the next 10 to 15 years a growing number of youths and adults will "lack the education and skills to obtain even their first entry-level job."

The Bureau of Labor Statistics estimates that about 20 percent of the jobs expected to be available in 1995 will require four or more years of college--up from about 16 percent in 1984.

While not all institutions of higher learning view continuing education for adults as central to their role and mission, many others are engaged in providing a variety of new courses, schedules, programs and support services to meet the needs of adult learners and employers through technologically-based delivery systems. Whether it be at locations associated with business, industry, hospitals, schools, or wherever, colleges and universities are applying technology to the teaching/learning processes.

MICROWAVE

Among the myriad of communication technologies being used in the marketplace, Instructional Television Fixed Services (ITFS) or other forms of terrestrial microwave are advancing educational opportunity for the adult learner. Since not all persons associated with adult learning are familiar with some of the applications of microwave technology, an effort will be made to provide an overview of the technology and the various forms of its applications across the country.

For the uninitiated, microwave is a wireless point-to-point transmission vehicle that uses radio frequencies to transmit analog or digital signals. It requires no physical connection between transmission and receiving points. Thus, coupled with its advantages over wireline technologies in urban, mountainous or forest terrains, it is fairly easy to build and use, particularly as an alternative to traditional telephone facilities.

Although a high traffic volume is considered to be important to support a microwave system, many large corporate and educational users are saving money on communications services by building their own private microwave networks. Start-up costs range from approximately $15,000 for low-capacity systems to $200,000 for high capacity systems. Private microwave networks represent an investment that will ultimately yield cost containment for voice, video and data services.

The Federal Communications Commission (FCC) allocates frequencies for microwave communications from between 2 and 24 GHz. Initially, microwave frequencies of 2 to 12 GHz were allocated. However, higher frequencies have opened and are capturing an increasing market share because of overcrowding in the 2 to 12 GHz range in urban areas. Most notably, high frequency microwave systems operating in the 18 to 24 GHz range are emerging as important suppliers of short-haul communications in these congested areas.

APPLICATIONS

Microwave distribution systems are alive and most are well throughout the country. While some systems are "stand alones" most are part of a telecommunication technology system involving more than one technology. The interconnection of ITFS, satellite, microwave, telephone and computer technologies is intertwined in creative ways to address the lifelong learning options available for people at a variety of sites.

The Eastern Educational Network (EEN) is a microwave interconnection system linking public television stations from Maine to Delaware. Founded 20 years ago and headquartered in Boston, EEN serves primarily as a distribution point for secondary, or backup, programs when a satellite system is having transmission problems. It currently has 13 interconnected stations and two state networks.

The South Carolina Educational Television System may be the largest instructional television system in the nation. Within the last 2 years, the South Carolina Television Commission has embarked on an ambitious program to upgrade the technical capability of their network. Television instruction, using a variety of technologies including microwave distribution, includes programs for middle and secondary public schools throughout the state, professional and continuing education in the state's higher education institutions, medical education, law enforcement training and other continuing and professional education fields.

An educational telecommunications network has been proposed for Massachusetts involving a point-to-point pipeline that would run East/West through the state along the Massachusetts Turnpike, with main connecting points throughout the state. The pipeline would interconnect a series of ITFS stations appropriately spaced throughout the state. Seen as having the potential to become the means of widespread, economical distribution of education and information with far-reaching social and occupational consequences for public and private sector alike, the network has yet to be fully realized. Nevertheless, when (and if) the Network is realized, it will facilitate the rapid, flexible and economical flow of educational programming and information to learners in all sectors and in all regions of the state.

The Indiana Higher Education Telecommunications System (IHETS) is a comprehensive, highly decentralized, closed circuit multichannel telecommunications network serving member institutions of higher education throughout the state. Participating institutions use the network primarily for course delivery.

In Kentucky, the Kentucky Educational Television offers primarily K-12 instructional programming with some higher education, adult basic education and general educational programs. Working in conjunction with the Kentucky Telecommunications Consortium, offerings also include continuing education of various professional groups, including nurses, attorneys, pharmacists, engineers, realtors, school teachers and teachers.

PENNARAMA represents a partnership between Pennsylvania State University and individual cable systems in the state. Interconnected by microwave technology, the statewide delivery system will eventually provide extensive educational programming to an estimated 1.2 million cable households. Designed to be of value to Pennsylvanians who are pursuing degrees, occupational qualifications, or avocational interests on a part-time basis, PENNARAMA is an effective way to deliver credit courses, credit-free courses, and community services in the areas of general education, professional and occupational education, and recreation and leisure-time activities.

The Association for Higher Education of North Texas (AHE) was incorporated in 1980 by merger of The Association for Graduate Education and Research of North Texas (TAGER) and the Interuniversity Council(IUC). Some 17 institutions of higher education participate in the Association. One of the features of the Association network is a microwave system interconnecting the associated institutions with the other capabilities of the network, including ITFS and satellite delivery. Here again, programming is a shared responsibility and a collaborative arrangement among the participating Association members as well as the receiving institutions, school districts and other users of the network.

Wisconsin's Educational Television Network reflects a commitment on the part of the people of the state to develop statewide television. In 1971, the state Legislature authorized an independent agency, appropriated funds, and charged it with the task of extending educational television to residents throughout the state. UHF and affiliated stations were interconnected by microwave to create the Wisconsin Educational Television Network. In the years ahead, the Educational Communications Board will be continually upgrading the network and will continue its coordination role with the various state agencies to provide Wisconsin citizens of all ages with current instructional and informational programming.

In California, The California State University (CSU) has established the Central Valley Microwave Network and is constructing another leg between two of the campuses. This electronic highway will, when fully operational, interconnect 4 CSU campuses, Chico, Sacramento, Stanislaus, and Fresno along with a public broadcast station in Fresno. Designed for two-way audio, video and data transmission, the Network will provide a means by which the campuses will share information and resources, including programming. The Network is intended to accomplish the following:

- provide an integrated and shared telecommunications system to meet the needs of a diverse population, including many handicapped, minority, and elderly citizens separated from campuses by distance, terrain, and inclement weather,

- implement a model for cooperation among educational institutions and public broadcast stations,

- resolve "last mile" issues between campuses and public broadcast stations by using a mix of cable and microwave for the distribution of satellite received programs,

- provide access to PBS satellites for statewide and national programming distribution, and

- provide opportunities for students, faculty, administrators in public schools and colleges and universities, public broadcast stations and community residents to interact with one another via teleconferences, originate and broadcast programs, conduct meetings, exchange information and generally provide for lifelong learning opportunities.

Already the Network has been used to facilitate a statewide and national teleconference involving one of the campuses as the originator and several of the campuses as receive locations. Other opportunities envisioned for the future include:

- sharing of unique educational programs among campuses and public broadcast stations;

- extending opportunity to "share" visiting faculty members and guest lecturers;

- increasing the range of lifelong learning opportunities available to students off and on-campus;

- permitting live, interactive talk-back between "distant" students and the faculty members; and

- enabling simultaneous teaching to students in class at campus and to students where they work, or at another campus.

OBSERVATIONS

Assuming that an institution of higher education desires to move in the direction of meeting adult learning needs through the use of technology, such as microwave, several issues must be addressed by the institution or organization attempting to provide for its citizens or clientele the widest possible range of access and choice. The following observations are offered for consideration:

- Support from the central administration is essential if the use and application of communication technologies is to succeed. Unless the administration is clearly committed to the ideas by establishing policies and procedures supportive of the desired changes, a project will have a limited chance of meeting with success. Budgeting special funds, reallocating existing resources, facilitating external fund raising earmarked for adult learning opportunities, and moving toward making communication technologies a part of the fabric of the institution all contribute to making these alternative delivery mechanisms integral to the institution.

- Policy endorsed by the governing board establishes the framework for the development of communication technologies. In CSU, for example, our governing board has stated that "current operations and future planning should incorporate state-of-the-art technology to improve service and reduce operating costs as, for instance, in permanently installed equipment in classrooms and laboratories, campuswide communications via electronic distribution systems, video disc technology, computer storage and delivery of information, communication satellites, and like technological advances." Without policy endorsement, the institution or the system will have a very difficult time in making decisions regarding how best to proceed.

- Key roles are played by many individuals in a participatory planning process. Necessary involvement of many individuals, particularly in a complex organization, is more likely to occur in a system where effective central coordination is combined with decentralized control. The people that are a part of the technological system, particularly technicians and media types coupled with faculty and support staff must be seen as more than mere clients of the network. They must share in determining the plans. Expertise can be mobilized without granting certain educators or bureaucrats dominating roles because of their perceived importance or position.

- Strategically, the development of a technical infrastructure should occur in advance of programmatic consensus. While this may sound like blasphemy, the fact of the matter is that an institution should not wait for consensus to be reached on the programmatic applications of communication technologies. The ability to put in place a technical system responsive to the agreement may not be accomplished because of time lost and the availability of a diminishing resource known as the electromagnetic spectrum. This is particularly true when one considers ITFS and other microwave and radio frequencies requiring regulatory agency, the Federal Communications Commission (FCC), involvement. The current FCC processes make it very difficult for education to access frequencies and obtain licenses necessary for technical configurations to be impaired.

- When implementing your communication technology plans, use a time frame incorporating the worst case scenarios. Regulatory delays, procurement processes, financial constraints, weather conditions, manufacturing and vendor problems, and a myriad of other exigencies will cause timeframes to be missed, commitments not honored, and anxiety to be heightened. When implementation does not occur amidst expectations of starting up a project by a certain date, you may lose more than you gain.

- Essential ingredients for successful implementation of communication technologies in an educational setting are visible advocates and an infrastructure of good human resources. This point cannot be stated strong enough. Without a dedicated group of individuals working individually and collectively, the best plans will not be realized by the institution and any effort will be counter-productive. The institution needs to recognize the contributions made by the staff and take whatever steps are necessary to provide reward and recognition for their contributions.

- Decisions to utilize microwave technology in meeting adult learner needs, as with other communications technologies, must be based on a sound business plan that projects bottom line success. Short-term, add-on uses of technology need proper planning, perseverance, and commitment as essential ingredients if programs and procedures are to achieve anticipated goals.

CONCLUSION

In conclusion, many institutions of higher learning serve adult learners who cannot or choose not to participate in a conventional degree program; therefore, accessibility is a key issue in developing an instructional design and delivery plan which is specifically responsive to the needs of that particular student population. Accessibility involves the transferability of academic credit, assessment of prior learning, and flexible and convenient instructional delivery methods, all of which are important to the employed adult learner in particular.

The rapid growth of technology, coupled with dramatic changes in demographic data, require each institution to become more creative and innovative in planning and developing instructional programming for the adult learner. Educational institutions must review their commitment to the adult learner and plan and develop instruction which will assist adults in meeting their academic objectives. Microwave technology, along with several other communication technologies, offers a means for the adult learner to be better served.

Where do we go from here? It depends. It depends on a lot of people and things, but most importantly, on people.

It also depends on leadership. A wide base of enlightened, unswerving leadership is required at all levels to plan and organize action, to arouse interest, to evoke cooperation.

It depends on professional practitioners. They, particularly continuing education and media personnel, have been entrusted with most of the keys and all of the locks. Whether they are given more keys or fewer locks will depend on the degree of enlightened guidance regarding the adult learner that comes from their ranks.